Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Exploring the Effects of the COVID-19 Pandemic on the Children and Families Cared for by Pediatric-Focused Advanced Practice Registered Nurses

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Introduction: The coronavirus disease 2019 (COVID-19) pandemic has significantly affected children and families. The study purpose was to better understand the perceptions of pediatric-focused advanced practice registered nurses (P-APRNs) on the impact of COVID-19 on patients and practice.

Method: A 25-item electronic survey including Likert scales, multiple choice , and open-ended questions was sent by e-mail to electronic mailing list of the National Association of Pediatric Nurse Practitioners.

Results: Responses (N = 109) reflect the magnitude of challenges affecting child physical health, mental health, parental stress, and social determinants of health. P-APRNs expect greater refusal of the COVID-19 vaccine compared with other vaccines. Telehealth use continues at an increased rate and greater resources are needed to support clinical practice.

Discussion: The COVID-19 pandemic has transformed the lives of children, families, and P-APRN practice. These findings reflect challenges and opportunities moving forward. P-APRNs are well-prepared to lead change to support better and more equitable outcomes for all. J Pediatr Health Care. (2022) *36*, 321−329

KEY WORDS

Pediatric, advanced practice registered nurse, COVID-19, children's health

INTRODUCTION

Significant changes have occurred globally because of the coronavirus disease 2019 (COVID-19) pandemic. People have experienced dramatic shifts in the way that they work, carry out everyday activities, and interact with others. For children, changes have occurred in the way that school and peer interactions occur and in the way they access health care. Pediatric-focused advanced practice registered nurses (P-APRNs) play a significant role in the provision of health care services for children across a variety of settings and have seen diverse changes in the health status of the children and families they care for (Bartek, Peck, Garzon, & VanCleve, 2021; Peck & Sonney, 2021). P-APRNs have been forced to adapt because of the pandemic to provide health care services in this globally transformed context for well-child care, common acute issues including children with COVID-19, mental health disorders, and the care of a variety of chronic health conditions.

During the COVID-19 pandemic, there have been social restrictions and infection mitigation efforts that have altered the typical way health care is delivered. Significant changes have been reported related to when children (1) are seen for well-child care (Patrick et al., 2020), (2) receive immunizations according to the recommended schedule (Santoli et al., 2020; Vogt et al., 2020), and (3) have access to specialty services—particularly mental health services (Henderson, Schmus, McDonald, & Irving, 2020; Patrick et al., 2020). These changes and the broader social and health implications related to the pandemic are expected to create lasting challenges with children's health, but the scope and duration of these challenges cannot be fully predicted (Peck & Sonney, 2021).

The pandemic and associated changes to normal life patterns have caused a significant amount of increased stress and worry among children and their parents or caregivers (Ellis, Dumas, & Forbes, 2020; Gassman-Pines, Ananat, & Fitz-Henley, 2020; Patrick et al., 2020; Russell, Hutchison, Tambling, Tomkunas, & Horton, 2020). These dramatic changes in the everyday lives of children have led to increased stress, loneliness, mental health concerns, depression, and anxiety in the pediatric population (Bartek et al., 2021). A recent meta-analysis revealed that pediatric and adolescent depression and anxiety rates have doubled during the pandemic (Racine et al., 2021). Children with chronic health conditions have seen even greater increases in these areas during the pandemic (Ademhan Tural et al., 2020; Amorim et al., 2020; Pinar Senkalfa et al., 2020). Beyond the increased levels of stress and worry, the pandemic has resulted in decreased physical activity in children (Xiang, Zhang, & Kuwahara, 2020). These changes in mental and physical health factors increase the risk for poorer quality of life, obesity, and a variety of other mental and physical health concerns.

Practice changes have occurred owing to the pandemic. Telehealth has been adopted in many practices in an attempt to better meet patient needs amid the pandemic (Evans, Golub, Sequeira, Eisenstein, & North, 2020). Offices have implemented protocols to test for COVID-19 and to administer the COVID-19 vaccine. Separate physical spaces have been designated for well versus ill children in many practices. Many practices are trying to meet the mental and physical health needs of patients but are met with inadequate support services.

Further investigation into the effects that the pandemic has had on children and families as well as any changes in health patterns or practices is important to supporting high-quality health outcomes. A gap exists in the literature related to the clinical practice experiences and additional resources needed by P-APRNs caring for children during the COVID-19 pandemic. Therefore, the purpose of this study was to describe the perceptions of P-APRNs on the impact of COVID-19 on their patient population and practice. This study addressed the following questions:

(1) What effects have P-APRNs seen in their practice related to children's physical health, mental health, social determinants of health, and parent or caregiver stress?

What patient and family perceptions toward vaccination (COVID-19 and routine immunizations) have P-APRNs seen in their practice?

(1) To what extent have P-APRNs adopted telehealth in their current practice setting?
(2) What additional resources do P-APRNs need to best care for their patient population?

METHODS

Sample and Setting

A descriptive survey design with a convenience sample was used. The survey was distributed electronically to members of the National Association of Pediatric Nurse Practitioners (NAPNAP) by e-mail through their membership electronic mailing list. At the time of writing, NAPNAP reported having greater than 8,200 members. All members are included in the NAPNAP member electronic mailing list database unless explicitly opting out of e-mail communication from the organization. Individuals eligible for inclusion were board certified nurse practitioners who spend at least 50% of their clinical time caring for children. Exclusion criteria included non-nurse practitioner health care providers, those not actively practicing in a clinical setting, or those caring for children less than 50% of their allocated clinical time. The total number of eligible participants was unknown.

Instrument

A 25-item electronic survey was developed by a team of experts in pediatric advanced practice nursing, including four P-APRNs and a pediatric nurse scientist. The survey questions addressed the research questions and included demographic questions and items specific to the P-APRN's perceptions of the impact of COVID-19 on the physical

health, mental health, and social determinants of health of the children cared for by P-APRNs, family perceptions toward vaccination, and the use of telehealth as well as changes in and needs for P-APRN practice. Items included in the final survey included a mixture of Likert scales, multiple choice questions, and open-ended questions. The items asking if changes had been noted in the pediatric nurse practitioners (PNPs) practice related to physical health, mental health, social determinants of health, and caregiver stress all began with "Since the onset of the COVID pandemic, what changes have you seen in the following in your practice?" Responses were on a 7-point Likert scale with 1 equal to a significant decrease; 2, a moderate decrease; 3, a slight decrease; 4, no change; 5, a slight increase; 6, a moderate increase; and 7, a significant increase. For example, the item on mental health impact asked participants, "Since the onset of the COVID pandemic, what changes have you seen with the following mental health concerns in your practice?" Eleven mental health concerns were listed, such as anxiety, somatic complaints, and self-harm. The survey was hosted on Research Electronic Data Capture (Harris et al., 2009).

Procedures

This study was reviewed by the institutional review board at The University of Iowa. The study was subsequently reviewed and approved by the NAPNAP Research Committee. On receipt of the required approvals, an e-mail was sent by NAPNAP staff members to NAPNAP members through the electronic mailing list. The e-mail sent to members included an invitation to participate, details about the study and consent, and a link to the Research Electronic Data Capture survey. Recipients were notified that completion of the survey implied consent and that the survey could be exited at any time. Within the survey, the initial questions determined inclusion/exclusion criteria status using branching logic. The study details and invitation to participate were sent once to membership in June 2021 and were open for 2 weeks. Although the authors planned to resend the survey 2 weeks after the initial distribution, NAPNAP policy limited it to single distribution of the survey.

Analysis

Data were analyzed using SAS 9.4 (SAS Institute Inc, 2014). Summary statistics and descriptive statistics were calculated for respondent characteristics (mean and standard deviation, frequencies, and percentages). Descriptive statistics were used (frequencies and percentages) for COVID-19 impact on physical health; mental health; social determinants of health; and caregiver stress, perception toward vaccinations, and resources needed during COVID-19. Data from incomplete surveys that included at least some responses beyond demographic items were included in analysis ($n = 11$).

RESULTS

Characteristics of the responding P-APRNs are provided in Table 1. A total of 109 individuals completed the survey

TABLE 1. Survey respondent characteristics

Variable	*n*	Mean ± standard deviation (range)
Age, years	98	49.5 ± 11.7 (29.0–71.0)
Years in practice	97	16.7 ± 11.9 (1.0–48.0)
	n	%
Highest academic degree[a]		
MSN	72	72.7
DNP	19	19.2
PhD	4	4.0
Other Master's	2	2.0
Other	2	2.0
Practice area[b]		
Pediatric primary care	73	67.0
Pediatric specialty care	28	25.7
Pediatric acute care	13	11.9
Faculty/nursing education	5	4.6
School health	4	3.7
Research	2	1.8
Community/public health	2	1.8
Family practice	1	0.9
Other	4	3.7
Practice facility		
Private practice	41	37.6
University-affiliated hospital/system	26	23.9
Large hospital/system	17	15.6
Federally qualified health center	14	12.8
Community health center	5	4.6
Community hospital	1	0.9
Other	5	4.6
Practice setting[b]		
Outpatient setting	99	90.8
Inpatient setting	17	15.6
Other	3	2.8
Geographic region[b]		
Suburban	40	36.7
Urban	39	35.8
Rural	21	19.3
Other	1	0.9
Country		
United States	86	97.7
Canada	2	2.3
Professional role[b]		
PNP-PC	89	81.7
PMHS	8	7.3
FNP	7	6.4
PNP-AC	6	5.5
PNP-AC/PC	5	4.6
PMHNP	1	0.9
Other	1	0.9

Note. *N = 109. DNP, Doctor of Nursing Practice; FNP, family nurse practitioner; MSN, Master of Science in Nursing; PMHNP, psychiatric-mental health nurse practitioner; PMHS, pediatric primary care mental health specialist; PNP-AC, pediatric nurse practitioner–acute care; PNP-PC, pediatric nurse practitioner –primary care.*

[a] *Percentages do not sum to 100% owing to rounding.*

[b] *Subjects could choose more than one answer.*

with different numbers of P-APRNs replying to each question. The percentages for each category were based on the number of valid replies to the question. The P-APRNs had an average of more than 16 years of experience (mean = 16.7, standard deviation = 11.9, range 1−48 years). The most common academic degree for these P-APRNs was a master's degree in nursing for 72.7%, and most (81.7%) were certified as pediatric nurse practitioner−primary care. The practice area for these P-APRNs varied with most (67%) in primary care. Most practiced in the outpatient setting (90.8%).

The impact of COVID-19 on children's physical, mental, and social health is seen in Table 2. These P-APRNs noted a significant or moderate decrease in children receiving routine well-child care (mean of 2.6 ± 1.1 on the 7-point Likert scale), standard recommended (non-COVID-19) immunizations (2.5 ± 1.0), and identification of developmental delays (3.3 ± 1.2). In addition, they noted a moderate or significant increase in inadequate physical activity (5.9 ± 1.4), obesity (5.5 ± 1.3), poor nutrition (5.5 ± 1.2), and difficulty accessing specialty care (5.0 ± 1.5) among the children in their practices. There was also a moderate or significant increase among the children they cared for in anxiety (6.2 ± 1.0), depression (6.1 ± 1.0), academic concerns (6.0 ± 1.1), and behavioral concerns (5.6 ± 1.0), resulting in an increase in referrals for mental health support (6.2 ± 1.2) but also difficulty in accessing specialty care (5.5 ± 1.3). Along with an increase in physical and mental health concerns during COVID-19, these P-APRNs noted an increase in a number of social issues, particularly in multiple caregiver stressors such as remote learning (6.6 ± 0.8), increased screen time (6.5 ± 0.9), increased media use (6.4 ± 1.0), child socialization/isolation (6.3 ± 0.8), child supervision (6.0 ± 1.0), and parent or guardian job loss (5.6 ± 0.9).

Table 3 summarizes the P-APRNs' perceptions of parental responses to routine childhood immunizations and the potential use of a COVID-19 vaccine for children and adolescents. Although 77.9% of the responding P-APRNs stated that fewer than 10% of their patients refuse the recommended childhood immunizations, the responses changed when asked about a COVID-19 vaccine. Only 9.6% reported that fewer than 10% of the parents in their practice would refuse the COVID-19 vaccine, with more than 38.3% anticipating that more than 30% of the parents in their practice would refuse the COVID-19 vaccine for children and adolescents. The greatest barriers to COVID-19 vaccination among these families were thought to be misinformation about vaccines from social media (50.5% identified as a significant concern), fear of side effects (50.5%) mistrust of government (36.7%), and fear of vaccine ingredients (34%).

The survey included questions about the extent to which these P-APRNs adopted telehealth in their practice owing to COVID-19. Before COVID-19, only 8 of 88 advanced practice registered nurses (9.1%) who responded to this question were using telehealth in their practice. However, 88 of 101 (87.1%) reported using telehealth in their current practice. The Figure 1 shows the percentage of patients seen by telehealth owing to COVID-19 during 2020.

The final section of the survey asked if there had been times during COVID-19 when the P-APRNs felt they did not have the necessary resources to provide the desired level of care for their patients and, if yes, what additional resources they needed. Approximately 65% reported a lack of necessary resources (Table 4). The most frequently identified provider-focused resource needed was "resources for addressing social concerns" (76.8%), and the most common patient-focused resource needed was "mental health education materials" (84.9%).

DISCUSSION

The findings of this study are consistent with recently published studies in the literature that examined the effects of COVID-19 on children and families (Patrick et al., 2020; Peck & Sonney, 2021; Racine et al., 2021; Russell et al., 2020; Santoli et al., 2020). A unique contribution of this study is that it collectively examined the multifaceted, interrelated effects of the pandemic on the health and well-being of children and families through the lens of care provided by P-APRNs. It is clear that the COVID-19 pandemic has transformed the lives of children, families, and P-APRN practice alike. The scope of these findings reflects both challenges and opportunities moving forward.

The data collected in this study reflect a specific point during the pandemic for children, families and P-APRNs, but these findings present long-lasting implications for children's health. The COVID-19 pandemic has highlighted weaknesses already present in the health system (Peck, 2020). Barriers with access to care and the impact of social determinants of health on children's health outcomes are ongoing concerns but greater today than in the prepandemic health system. The increases in limited access to care and the impact of the pandemic on social determinants of health (food and housing insecurity, parent or guardian job loss, lack of transportation, and loss of insurance coverage) demonstrated in this survey present unique challenges to both care delivery and health outcomes.

The survey respondents reported a decrease in the number of children receiving routine well-child care and immunizations according to the recommended schedule—both mainstays of pediatric primary care. Children not receiving routine primary care are at risk for delay in the recognition of developmental, physical, and mental health concerns. These children also face an increased risk for contracting communicable disease because of the delay in immunization administration. Respondents overwhelmingly reported that the pandemic has had a negative impact on physical activity engagement and proper nutrition for children. These factors may lead to increased rates of chronic conditions including obesity, diabetes, and hypertension. Early identification of these risk factors and/or disease symptoms is valuable in supporting high-quality health outcomes. The negative long-

TABLE 2. Coronavirus disease (COVID) impact on physical health, mental health, social determinants of health, and caregiver stress

Variable	*n*	Mean ± standard deviation
Physical health[a]		
Routine well-child care	101	2.6 ± 1.1
Immunizations given on time	100	2.5 ± 1.0
Developmental delay identification	101	3.3 ± 1.2
Child abuse/neglect	106	4.2 ± 1.2
Obesity	103	5.5 ± 1.3
Inadequate physical activity	105	5.9 ± 1.4
Poor nutrition	105	5.5 ± 1.2
Difficulty accessing specialty care	108	5.0 ± 1.5
Other	100	5.9 ± 1.8
Mental health[b]		
Anxiety	103	6.2 ± 1.0
Depression	103	6.1 ± 1.0
Risk-taking behavior	99	5.0 ± 1.1
Substance use	98	4.8 ± 0.9
Behavioral concerns (e.g., aggression)	100	5.6 ± 1.1
Somatic complaints	99	5.6 ± 1.0
Self-harm	100	4.9 ± 1.1
Suicidal ideation	102	5.3 ± 1.1
Academic concerns	103	6.0 ± 1.1
Referrals for mental health support	102	6.2 ± 1.2
Difficulty accessing specialty care	102	5.5 ± 1.3
Other	98	4.2 ± 0.4
Social determinants of health[c]		
Food insecurity	100	5.1 ± 1.0
Housing insecurity	99	4.9 ± 1.0
Decreased access to transportation	101	4.9 ± 1.0
Parent/guardian job loss	102	5.6 ± 0.9
Loss of health insurance	100	4.9 ± 0.9
Limited access to necessary care	101	5.1 ± 1.0
Other	99	4.2 ± 1.0
Caregiver stress[d]		
Daycare	100	5.7 ± 1.0
Remote learning	102	6.6 ± 0.8
Education/school	102	6.4 ± 0.8
Child supervision	101	6.0 ± 1.0
Child social interaction/isolation	99	6.3 ± 0.8
Sports/activity participation	101	5.6 ± 1.4
Relationships with extended family	99	5.5 ± 1.3
Access to typical support network	102	5.6 ± 1.3
Increased screen time[e]	101	6.5 ± 0.9
Increased social media use	99	6.4 ± 1.0
Other	99	5.5 ± 1.7

Note. *Responses were on a 7-point Likert scale with 1 = a significant decrease and 7 = a significant increase.*
[a]*Each item began with asking subjects, "Since the onset of the COVID pandemic, what changes have you seen with the following physical health concerns in the children or adolescents in your practice?"*
[b]*Each item began with asking subjects, "Since the onset of the COVID pandemic, what changes have you seen with the following mental health concerns in the children or adolescents in your practice?"*
[c]*Each item began with asking subjects, "Since the onset of the COVID pandemic, what changes have you seen with the following social concerns in the children or adolescents in your practice?"*
[d]*Each item began with asking subjects, "Since the onset of the COVID pandemic, what changes in parent stress have you seen related to the following stressors in your practice?"*
[e]*Non-school/non-therapy screen time.*

term effects that have been a result of the pandemic are likely to extend beyond those directly related to the severe acute respiratory syndrome coronavirus 2 pathogen.

Most P-APRNs who responded to this survey indicated a significant increase in behavioral concerns, anxiety, depression, and academic concerns directly associated with the COVID-19 pandemic. Although not reflected in most responses, increases in abuse, neglect, suicidal ideation, and risk-taking behavior pose eminent threats to children's health and well-being. These clinical findings have resulted in an increase in referrals for mental health support only to be met with difficulty accessing specialty care services. The

TABLE 3. Perceptions toward vaccinations

Variable	*n*	0%–5% *n* (%)	6%–10% *n* (%)	11%–15% *n* (%)	16%–20% *n* (%)	21%–25% *n* (%)	26%–30% *n* (%)	> 30% *n* (%)
What percentage of your patient population refuses standard recommended immunizations?	95	48 (50.5)	26 (27.4)	10 (10.5)	5 (5.3)	3 (3.2)	1 (1.1)	2 (2.1)
What percentage of your population do you anticipate will refuse the COVID vaccine?	94	1 (1.1)	8 (8.5)	12 (12.8)	15 (16.0)	14 (14.9)	8 (8.5)	36 (38.3)

	n	Not a concern *n* (%)	Minimal degree of concern *n* (%)	Moderate degree of concern *n* (%)	Significant degree of concern *n* (%)
Greatest barriers to COVID vaccination[a]					
Misinformation about vaccine obtained from social media sources	97	0 (0.0)	11 (11.3)	37 (38.1)	49 (50.5)
Fear of side effects	97	0 (0.0)	4 (4.1)	44 (45.4)	49 (50.5)
Fear of vaccine ingredients	97	3 (3.1)	23 (23.7)	38 (39.2)	33 (34.0)
Concerns about vaccine mechanism of action	98	9 (9.2)	25 (25.5)	39 (39.8)	25 (25.5)
Mistrust of government	98	2 (2.0)	23 (23.5)	37 (37.8)	36 (36.7)
History of refusal of other immunizations	97	9 (9.3)	32 (33.0)	38 (39.2)	18 (18.6)
Belief that children are lower risk for serious illness	96	8 (8.3)	20 (20.8)	44 (45.8)	24 (25.0)
Lack of access to vaccine	98	50 (51.0)	29 (29.6)	16 (16.3)	3 (3.1)
Other	96	1 (1.0)	0 (0.0)	0 (0.0)	1 (1.0)

Note. *Percentages may not sum to 100% owing to rounding.*

[a]*Subjects were asked, "What do you anticipate to be the greatest barriers to COVID vaccination in your population once the vaccine is approved by the FDA for use in children?"*

respondents also reported that families are experiencing remarkable increases in stress owing to the pandemic in the areas of remote learning/education, social interaction, child supervision, and family relationships. The pandemic has also magnified stress levels related to emerging concerns including screen time and social media use.

The identification of the effects of the pandemic on the mental health and well-being of children and families has been recently identified as a national emergency by the American Academy of Pediatrics, the American Academy of Child and Adolescent Psychiatry, and the Children's Hospital Association (American Academy of Pediatrics, 2021). Recognition by these organizations of the barriers to access to care, shortages of mental health providers, and increasing numbers of children and teens affected by the pandemic highlights the need for policy and practice changes in the health care system. To improve access to care, P-APRNs must begin to promote and implement models of integrated mental health in primary care settings. P-APRNs are well suited and prepared to provide this integrated care (Van Cleve, 2013). Systemic practice changes can be implemented to support P-APRNs to provide mental health care and support the growing need for integration (Foy, Green, Earls, & Committee on Psychosocial Aspects of Child and Family Health, Mental Health Leadership Work Group, 2019). Now, maybe more than ever, there is tremendous opportunity for the dual preparation of PNPs and family nurse practitioners in psychiatric mental health nurse practitioner programs (Wesemann, Dirks, & Van Cleve, 2021). PNPs and family nurse practitioners may also pursue added certification as pediatric mental-health specialists to influence system-level changes that support expanded access to care.

It is widely believed that the development and deployment of the COVID-19 vaccine is a central element in the pandemic response (Moorthy, Smith, & Staples, 2021). Despite this, the survey respondents indicated an anticipation of greater levels of vaccine hesitancy with the COVID-19 vaccine than that seen in their practices with other traditional immunizations. This finding is congruent with increased parent-reported vaccine hesitancy related to the COVID-19 vaccine when compared with other vaccines (Ruggiero et al., 2021). Reasons for this P-APRN–anticipated increased hesitancy are perceived to be rooted in misinformation, fear of ingredients or side effects, and mistrust of government. P-APRNs must possess a depth of knowledge related to the COVID-19 vaccine for children to provide families with scientifically based vaccine information and be able to address these perceived objections.

One strategy for improving access to care during the COVID-19 pandemic has been the adoption of telehealth services (Curfman et al., 2021). Although telehealth has been discussed as a future-oriented solution for some barriers with accessing care, this technology-based solution was not widely adopted before the pandemic. The onset of the COVID-19 pandemic presented the impetus for advancing the use of this service (Curfman et al., 2021). Survey responses revealed a sharp increase in the percentage of visits completed using telehealth at the onset of the pandemic with a sustained increase in telehealth use during the time period measured. P-APRNs are uniquely positioned to both continue providing telehealth care and advocating for advances and improvements in telehealth service delivery. Advocacy within organizations for these purposes and within the policy domain for equitable reimbursement and regulations conducive to telehealth care present opportunities for P-APRNs to lead change and support expanded access to care.

There is a significant need for additional resources with nearly two thirds of respondents reporting inadequate resources. The areas of greatest need for provider-focused resources included resources addressing social concerns, strategies for supporting healthy families, clinical practice guidelines, and continuing education about pandemic-related topics. The greatest need for patient-focused resources included mental health education, community resources, and written or electronic resources. The need for these resources presents an opportunity for P-APRNs to fill this void through the creation of necessary resources and to design professional and patient education. P-APRNs must conduct research, measure outcomes, and employ quality improvement measures in practice to generate the data needed to guide best practices in caring for children and families through the remainder of the pandemic and into the postpandemic future. The ability of P-APRNs to create and innovate in the face of unprecedented challenges will benefit children, families, and the profession now and in the future.

The survey data collectively reflect the depth of challenges faced by children, families, and P-APRNs. However, these also begin to outline opportunities for P-APRN–led changes that target both professional and system barriers. The P-APRN professional identity and theoretical underpinnings serve as a foundation for addressing emerging issues in children's health. Relationally focused care provided by P-APRNs can illuminate opportunities for interventions to address pandemic-related challenges. P-APRNs should continue to advocate for policies that support patient access to advanced practice registered nurses–led care and address existing policies that create barriers to P-APRN care.

Limitations

This study attempted to survey a large percentage of the NAPNAP membership, but only a small percentage of members participated. Those who participated were experienced in their field and were from diverse geographic areas. Questions aligned more closely with outpatient practice settings. Experiences of those practicing in acute care settings may differ. Although the authors planned to resend the survey invitation 2 weeks after the initial distribution, NAPNAP policy at the time of distribution limited it to single distribution of the survey thus limiting responses. Furthermore, this survey represented P-APRNs' perceptions at a defined point in an ongoing pandemic. The survey was distributed at a time in which simultaneous social unrest and natural disasters were also occurring, thus potentially

FIGURE 1. Use of telehealth during the coronavirus disease 2019 pandemic.
[A] SURVEYS COMPLETED DURING JUNE 2021. [B] SUBJECTS WERE ASKED, "WHAT PERCENTAGE OF PATIENTS DID YOU SEE VIA TELEHEALTH AS A RESULT OF CHANGES RELATED TO THE COVID PANDEMIC?" FOR EACH DATE INTERVAL. [C] PERCENTAGES MAY NOT SUM TO 100% OWING TO ROUNDING. COVID, CORONAVIRUS DISEASE.

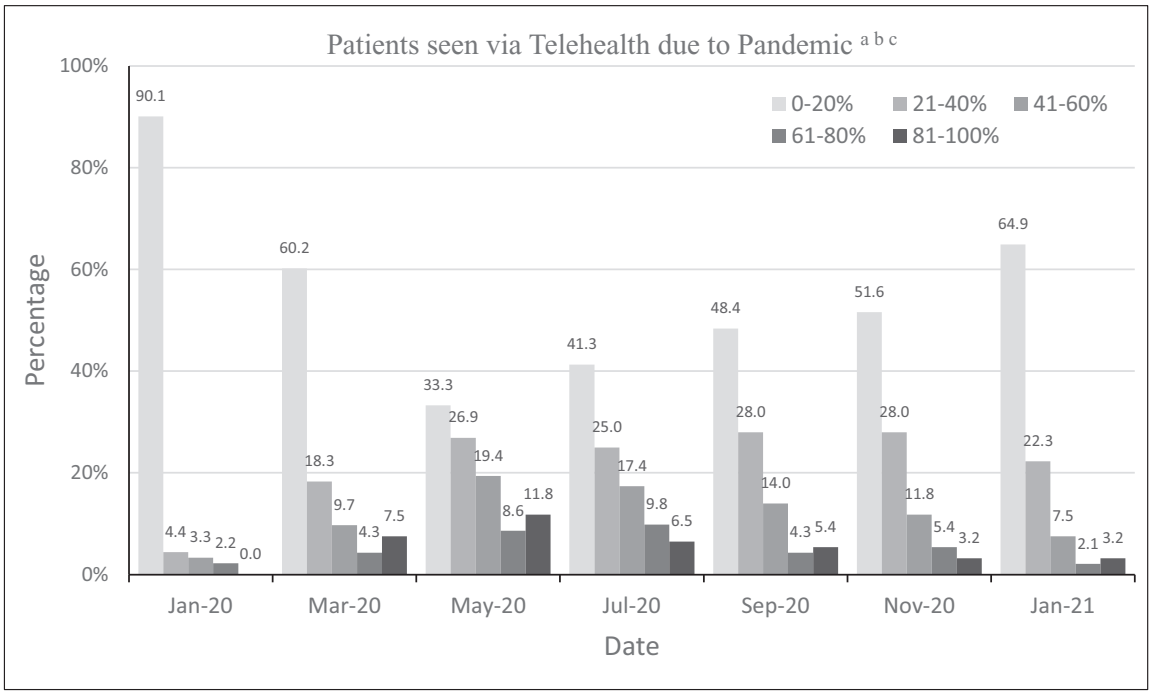

TABLE 4. Resources needed during coronavirus disease (COVID) pandemic

Variable	*n*	%
Lack of the necessary resources to provide care[a] (*N* = 99)	64	64.7
What provider-focused resources would be helpful/needed?[b]		
Resources for addressing social concerns (*N* = 99)	76	76.8
Practice guidelines for children's health during pandemic (*N* = 99)	53	53.5
Recommendation for supporting healthy families (*N* = 99)	49	49.5
Continuing education related to child and family care during the pandemic (*N* = 99)	44	44.4
New screening tools (*N* = 99)	33	33.3
Other (*N* = 99)	5	5.1
What patient-focused resources would be helpful/needed?[b]		
Mental health education materials (*N* = 99)	84	84.9
Information about community-based resources (*N* = 99)	71	71.7
Written or electronic patient and family resources (*N* = 99)	62	62.6
COVID vaccine information/frequently asked questions (*N* = 99)	61	61.6
Educational materials about children's physical health during the pandemic (*N* = 99)	57	57.6
Resources about supporting healthy families (*N* = 99)	54	54.6
Other (*N* = 99)	1	1.0

[a]*Subjects were asked, "Since the onset of the COVID pandemic, have there been times where you felt you did not have the necessary resources to provide the desired level of care for your patients?"*
[b]*Subjects could choose more than one answer.*

limiting response rates. In the terms of survey contents, the perceptions of P-APRNs were measured rather than measurable practices or outcomes. The authors acknowledge there is potential for confirmation bias in measuring the perceptions of respondents amid persistent media coverage and social dialogue related to the pandemic.

CONCLUSIONS

This study collectively reflects the depth of challenges faced by children, families, and P-APRNs owing to the COVID-19 pandemic. The data presented the scope of these challenges through the lens of care provided by P-APRNs. These challenges present unique opportunities for P-

APRNs to contribute to improved outcomes for patients, families, and systems. P-APRNs are well prepared to lead change in clinical care, research and translational science, innovation, and advocacy to support better and more equitable outcomes for all.

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REFERENCES

Ademhan Tural, D., Emiralioglu, N., Tural Hesapcioglu, S., Karahan, S., Ozsezen, B., Sunman, B., … Kiper, N. (2020). Psychiatric and general health effects of COVID-19 pandemic on children with chronic lung disease and parents' coping styles. *Pediatric Pulmonology*, *55*, 3579–3586.

American Academy of Pediatrics. (2021). AAP-AACAP-CHA declaration of a national emergency in child and adolescent mental health. Retrieved from https://www.aap.org/en/advocacy/child-and-adolescent-healthy-mental-development/aap-aacap-cha-declaration-of-a-national-emergency-in-child-and-adolescent-mental-health/

Amorim, R., Catarino, S., Miragaia, P., Ferreras, C., Viana, V., & Guardiano, M. (2020). The impact of COVID-19 on children with autism spectrum disorder. *Revista de neurologia*, *71*, 285–291.

Bartek, N., Peck, J. L., Garzon, D., & VanCleve, S. (2021). Addressing the clinical impact of COVID-19 on pediatric mental health. *Journal of Pediatric Health Care*, *35*, 377–386.

Curfman, A., McSwain, S. D., Chuo, J., Yeager-McSwain, B., Schinasi, D. A., Marcin, J., … Olson, C. A. (2021). Pediatric telehealth in the COVID-19 pandemic era and beyond. *Pediatrics*, *148*, e2020047795.

Ellis, W. E., Dumas, T. M., & Forbes, L. M. (2020). Physically isolated but socially connected: Psychological adjustment and stress among adolescents during the initial COVID-19 crisis. *Canadian Journal of Behavioural Science /Revue Canadienne des Sciences du Comportement*, *52*, 177–187.

Evans, Y. N., Golub, S., Sequeira, G. M., Eisenstein, E., & North, S. (2020). Using telemedicine to reach adolescents during the COVID-19 pandemic. *Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, *67*, 469–471.

Foy, J. M., Green, C. M., Earls, M. F., & Committee on Psychosocial Aspects of Child and Family Health, Mental Health Leadership Work Group. (2019). Mental health competencies for pediatric practice. *Pediatrics*, *144*, e20192757.

Gassman-Pines, A., Ananat, E. O., & Fitz-Henley, J. (2020). COVID-19 and parent–child psychological well-being. *Pediatrics*, *146*, e2020007294.

Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research Electronic Data Capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics*, *42*, 377–381.

Henderson, M. D., Schmus, C. J., McDonald, C. C., & Irving, S. Y. (2020). The COVID-19 pandemic and the impact on child mental health: A socio-ecological perspective. *Pediatric Nursing*, *46*, 267–290.

Moorthy, G. S., Smith, M. J., & Staples, B. B. (2021). Coronavirus disease 2019 vaccine in children. *Pediatrics in Review*, *42*, 576–578.

Patrick, S. W., Henkhaus, L. E., Zickafoose, J. S., Lovell, K., Halvorson, A., Loch, S., … Davis, M. M. (2020). Well-being of parents and children during the COVID-19 pandemic: A national survey. *Pediatrics*, *146*, e2020016824.

Peck, J. L. (2020). COVID-19: Impacts and implications for pediatric practice. *Journal of Pediatric Health Care: Official Publication of National Association of Pediatric Nurse Associates and Practitioners*, *34*, 619–629.

Peck, J. L., & Sonney, J. (2021). Exhausted and burned out: COVID-19 emerging impacts threaten the health of the pediatric advanced practice registered nursing workforce. *Journal of Pediatric Health Care*, *35*, 414–424.

Pınar Senkalfa, B., Sismanlar Eyuboglu, T., Aslan, A. T., Ramaslı Gursoy, T., Soysal, A. S., Yapar, D., & İlhan, M. N (2020). Effect of the COVID-19 pandemic on anxiety among children with cystic fibrosis and their mothers. *Pediatric Pulmonology*, *55*, 2128–2134.

Racine, N., McArthur, B. A., Cooke, J. E., Eirich, R., Zhu, J., & Madigan, S. (2021). Global prevalence of depressive and anxiety symptoms in children and adolescents during COVID-19: A meta-analysis. *JAMA Pediatrics*, *175*, 1142–1150.

Ruggiero, K. M., Wong, J., Sweeney, C. F., Avola, A., Auger, A., Macaluso, M., & Reidy, P. (2021). Parents' intentions to vaccinate their children against COVID-19. *Journal of Pediatric Health Care: Official Publication of National Association of Pediatric Nurse Associates and Practitioners*, *35*, 509–517.

Russell, B. S., Hutchison, M., Tambling, R., Tomkunas, A. J., & Horton, A. L. (2020). Initial challenges of caregiving during COVID-19: Caregiver burden, mental health, and the parent–child relationship. *Child Psychiatry and Human Development*, *51*, 671–682.

Santoli, J. M., Lindley, M. C., DeSilva, M. B., Kharbanda, E. O., Daley, M. F., Galloway, L., … Weintraub, E. (2020). Effects of the COVID-19 pandemic on routine pediatric vaccine ordering and administration—United States, 2020. *MMWR. Morbidity and Mortality Weekly Report*, *69*, 591–593.

SAS Institute Inc. (2014). *SAS® OnDemand for academics: User's guide*. Cary, NC: SAS Institute Inc.

Van Cleve, S. N. (2013). The role of nurse practitioners in pediatric mental health. *Journal of Pediatric Health Care*, *27*, 162–163.

Vogt, T. M., Zhang, F., Banks, M., Black, C., Arthur, B., Kang, Y., … Lamont, B. (2020). Provision of pediatric immunization services during the COVID-19 pandemic: An assessment of capacity among pediatric immunization providers participating in the vaccines for children program—United States, May 2020. *MMWR. Morbidity and Mortality Weekly Report*, *69*, 859–863.

Wesemann, D. E., Dirks, M. S., & Van Cleve, S. N. (2021). Dual-track education for nurse practitioners: Current and future directions. *Journal for Nurse Practitioners*, *17*, 732–736.

Xiang, M., Zhang, Z., & Kuwahara, K. (2020). Impact of COVID-19 pandemic on children and adolescents' lifestyle behavior larger than expected. *Progress in Cardiovascular Diseases*, *63*, 531–532.